

Patent claims

1. A safety device (1) for a vehicle seat secured within a vehicle via lateral guides, said device comprising at least one securing rail (8) which is to be arranged in the vehicle in a positionally fixed manner in the region between the guides and has associated securing means (10), which are connected or are to be connected to the vehicle seat and interact with the securing rail (8) in such a manner that, in the case of regular seat loads, the securing means (10) are arranged in a contactless manner relative to the securing rail (8) and, by means of irregular, in particular accident-related deformations and/or movements in the region of the vehicle seat, come into engagement with the securing rail (8) locking the vehicle seat against further deformations/movements, characterized in that the securing means (10) and the securing rail (8) are designed in such a manner that, during the engagement, reaction forces, which act in the direction of axes (X, Y, Z) of a conventional vehicle coordinate system, are absorbed in a manner distributed to at least two different engagement regions of the securing rail (8).

2. The safety device as claimed in claim 1, characterized in that the securing means (10) have a first engagement part (20) for absorbing forces primarily in the direction of a vertical axis (Z) and, if appropriate, in the direction of a horizontal vehicle transverse axis (Y), and a second engagement part (22) for absorbing force primarily in the direction of a horizontal vehicle longitudinal axis (X).

3. The safety device as claimed in claim 2, characterized in that the first engagement part (20) is

connected rigidly to a seat frame (2) in such a manner that deformations or movements occurring in the region of the seat frame (2) cause it to come into an engagement position with the securing rail (8).

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4. The safety device as claimed in claim 2 or 3, characterized in that the second engagement part (22) can be moved relative to the first engagement part (20) in such manner that, by a certain actuating force (F) being applied to it, it can be moved from a non-engagement position into an engagement position also independently of the first engagement part (20).

5. The safety device as claimed in claim 4, characterized in that the second engagement part (22) is connected to a seatbelt securing means in such a manner that a belt tensile force acts on the second engagement part (22) as actuating force (F).

6. The safety device as claimed in one of claims 2 to 5, characterized in that, in its engagement position, the second engagement part (22) additionally also uses supporting sections (24) to absorb forces in the direction of the vertical axis (Z) and the transverse axis (Y).

7. The safety device as claimed in one of claims 1 to 6, characterized in that the securing rail (8) has an approximately U- or horizontally C-shaped cross section which is open upward in the direction of the seat for the engagement of the securing means (10) with a base (12) and two retaining limbs (16) bounding a longitudinal opening (14).

8. The safety device as claimed in claim 7, characterized in that the first engagement part (20) of the securing means (10) uses supporting sections (26)

to engage behind the retaining limbs (16) of the securing rail (8).

9. The safety device as claimed in claim 7 or 8,
5 characterized in that the securing rail (8) has locking means in the region of the base (12), in particular in the form of a plurality of tothing-like cutouts (28) distributed in the longitudinal direction of the rail, for engagement of a locking section (30) of the second
10 engagement part (22).

10. The safety device as claimed in one of claims 4 to 9, characterized in that the second engagement part (22) is designed as a double lever mounted pivotably
15 about a transverse axis (34), it being possible for a first lever section (36) to have the actuating force (F) applied to it, and a second lever section (38) serving for engagement in the securing rail (8).

20 11. The safety device as claimed in one of claims 4 to 10, characterized in that the second engagement part (22) is locked in its non-engagement position in such a manner that an unlocking for transferring it into the engagement position takes place only by means of an
25 actuating force (F) exceeding a certain minimum value.

12. The safety device as claimed in claim 11, characterized in that the second engagement part (22) is locked by a predetermined breaking point, in
30 particular in the form of a shearing pin (40).

13. The safety device as claimed in one of claims 6 to 12, characterized in that the supporting sections (24, 26) of the first and second engagement parts (20, 22),
35 which sections are provided for engaging behind the retaining limbs (16) of the securing rail (8), are offset with respect to each other in the longitudinal

direction of the securing rail (8).

14. The safety device as claimed in one of claims 6 to 12, characterized in that the supporting sections (24, 26) of the first and second engagement parts (20, 22), which sections are provided for engaging behind the retaining limbs (16) of the securing rail (8), are arranged together in a region of the longitudinal extent of the securing rail (8), the supporting sections (26) of the first engagement part (20) engaging behind the retaining limbs (16) of the securing rail (8) indirectly via the supporting sections (24) of the second engagement part (22) or vice versa.

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15. The safety device as claimed in one of claims 2 to 14, characterized in that the first engagement part (20) is an integral part of a frame longitudinal member (6) of the vehicle seat.

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16. The safety device as claimed in one of claims 2 to 14, characterized in that the first engagement part (20) is fastened to a frame transverse member (4) of the vehicle seat and protrudes freely from the transverse member (4) into the region of the securing rail (8).

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